Advanced Research Projects Agency • ENERGY

BEETIT

BUILDING COOLING AND AIR CONDITIONING

PROJECTS:	14	FUNDING YEAR:	2010
TOTAL INVESTMENT:	$30.3M	PROGRAM DIRECTOR:	Dr. Ravi Prasher
PROJECT DETAILS:	www.arpa-e.energy.gov/ProgramsProjects/BEETIT.aspx		

PROGRAM

The 14 projects that comprise ARPA-E's BEETIT program, short for "Building Energy Efficiency Through Innovative Thermodevices," are developing new approaches and technologies for building cooling equipment and air conditioners. These projects aim to drastically improve building energy efficiency and reduce greenhouse gas emissions such as carbon dioxide (CO_2) at a cost comparable to current technologies.

INNOVATION NEED

The demand for air conditioning in homes and work spaces is increasing. New and more efficient cooling methods are needed to reduce building energy consumption and environmental impact. Residential and commercial buildings currently account for 72% of the nation's electricity use and 40% of our CO_2 emissions each year, 5% of which comes directly from space cooling and/or air conditioning.

BEETIT GOALS

- Improve energy efficiency of HVAC systems by at least 50%
- Decrease greenhouse gas emissions
- Achieve cost-competitiveness with conventional systems

In addition, the refrigerants used in air conditioners and space cooling are potent greenhouse gases (GHGs) that may contribute to global climate change. These refrigerants can trap 1,000 times more heat in the atmosphere than CO_2 alone. Because the overwhelming majority of air conditioning and cooling systems run on electricity, and most U.S. electricity comes from coal-fired power plants which produce CO_2, there is a pressing need to support improvements that increase the efficiency of these technologies and reduce the use of GHG refrigerants in the decades to come.

POTENTIAL IMPACT

If successful, the acceleration of the research and development of energy efficient cooling technologies provides a tremendous opportunity to reduce energy demand from buildings and reduce GHG emissions.

- SECURITY: Increased energy efficiency would decrease U.S. energy demand and reduce reliance on fossil fuels—strengthening America's energy security.
- ENVIRONMENT: Refrigerants with polluting emissions could account for up to 10-20% of global warming by the year 2050. Several BEETIT technologies are focused on eliminating the use of these refrigerants.
- ECONOMY: Widespread adoption of BEETIT technologies could reduce the energy consumption for air conditioning of buildings—providing consumers with cost savings on energy bills.
- JOBS: As new technologies develop, there will be new job opportunities in the design, installation, testing, and maintenance of efficient heating and cooling systems.